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Infrastructure Deficit and Opportunities in Africa

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1. Introduction

There are huge investment opportunities in Africa, especially in infrastructure, where the benefits are expected to be high. In particular, Africa's absolute and relative lack of infrastructure points to the existence of untapped productive potential, which could be unlocked through scaling up investments in the sector. Notably, infrastructure plays a central role in improving competitiveness, facilitating domestic and international trade, and enhancing the continent's integration into the global economy. Coupled with better human development outcomes that improved infrastructure promises, the spillover effects and the dynamism that would be generated could support the continent's economic growth and poverty reduction efforts. Similarly, improved infrastructure could help eliminate some of the binding constraints to the realization of the benefits of globalization.

The estimated financing requirement to close Africa's infrastructure deficit amounts to USD 93 billion annually until 2020¹. In as much as this financing requirement is a challenge, African governments have a wide range of policy options that could open new sources of finance.

The good news is governments have started exploring opportunities for tapping into private financing, creating new partnerships and reducing wastage in such investments. This strategic shift has come about on the realization that scaling up financing from traditional sources alone would not be adequate to close the infrastructure gap. Also, there is evidence that those countries that have invested strategically in infrastructure are reaping the benefits². It is therefore crucial to open opportunities to attract new investors as well as exploring new mechanisms for financing infrastructure in Africa.

It is in this context that this brief attempts to assess Africa's infrastructure gaps and financing requirements to close such gaps. It also identifies financing sources and suggests new sources and financing instruments. This is followed by a brief narrative of the Bank's role in infrastructure. In concluding, the main message is that efforts by African governments to close the gaps present huge investment opportunities to all types of investors, especially the private sector.

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“The continent’s, road freight is about 4 times more expensive, power costs 14 US cents per kilowatt-hour against 5 – 10 US cents and mobile telephony costs USD 12 per month compared to USD 8 elsewhere.”

“In Morocco, nearly two-thirds of electricity production is by private producers.”

2. The State of Infrastructure Supply in Africa

Infrastructure investments in Africa have not kept pace with growth in demand, creating a huge deficit. Less than 40% of the continent’s population has access to electricity, about a third of the rural population has access to roads and only 5% of agriculture is under irrigation. The situation is no better for social infrastructure, with only 34% of the population having access to improved sanitation and a slightly better situation for clean water at about 65%. On the other hand, the Information and Communications Technology (ICT) sub-sector is characterized by huge differences across specific services. In 2008, four out of ten Africans had access to mobile phones, with penetration rates growing fastest compared to the rest of the world. However, internet density is just above 80 persons per thousand (less than one in ten), while the figure for fixed telephones are even lower.

Furthermore, Africa faces higher access costs compared to other developing countries. The continent’s, road freight is about 4 times more expensive, power costs 14 US cents per kilowatt-hour against 5 – 10 US cents and mobile telephony costs USD 12 per month compared to USD 8 elsewhere. There is no doubt that the African market is still underserved and the returns to investors are high. Investors that have gone into the telecommunications and finance sub-sectors, following improved regulatory conditions have realized higher returns compared to any other region in the world. UNCTAD reported that since 1990, the rate of return on foreign direct investment (FDI) in Africa has averaged 29%, and since 1991 it has been higher than in all other regions, in many years by a factor of two.³

2.1 Where do the Opportunities Lie?

Electricity – In 2008, only 38% of Africans had access to electricity compared to an average of 68% for all developing countries, 53% for South Asia and 80-90% for Latin America. The figure is even lower for Sub-Saharan Africa (SSA), currently at 26%. Furthermore, about 30 African countries endured on average 11.5 power outages in 2007. The power outages were due largely to lack of regional interconnectivity of the electricity grids and shortages in affected countries (Annex 1b). During this period, regional surpluses in generation capacity were noted for all the five sub-regions except for East Africa, which had intermittent shortages (Figure 1). Some of the surplus countries like South Africa now have deficits due to increases in demand. The costs of power outages are significant, with Africa losing almost 12.5% of production time compared to 7% for South Asia, which the next worst case (Figure 2). Therefore potential productivity gains from electricity supply, together with the associated income effect point to a market with significant growth potential.

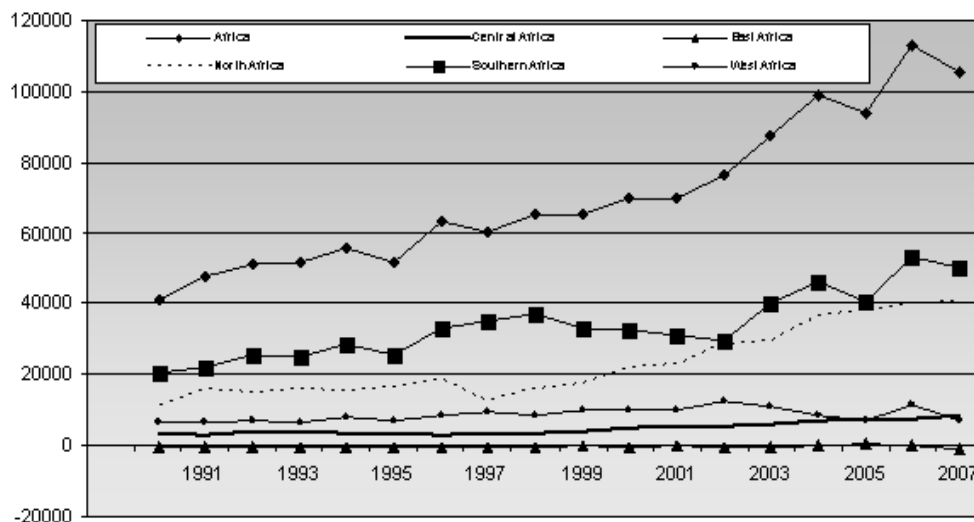
Indeed the emergence of independent power producers (IPPs) signals sweeping changes in the power sector. For instance, the National Energy Regulator of South Africa has established a regulatory environment that would allow upward adjustments in tariffs and thus improve the viability of private sector suppliers. In Morocco, nearly two-thirds of electricity production is by private producers, the Jorf Lasfar Energy Company - presently Africa’s largest IPP, Compagnie Eolienne de Detroit (CED) and Energie Electrique de Tahaddart (EET).

“Having realized the inadequacy of public funds in developing road infrastructure Africa is moving quickly into toll road.”

More importantly, the majority of project financing for these companies was sourced from local Moroccan banks and the sector is now diversifying into clean energy and other more efficient

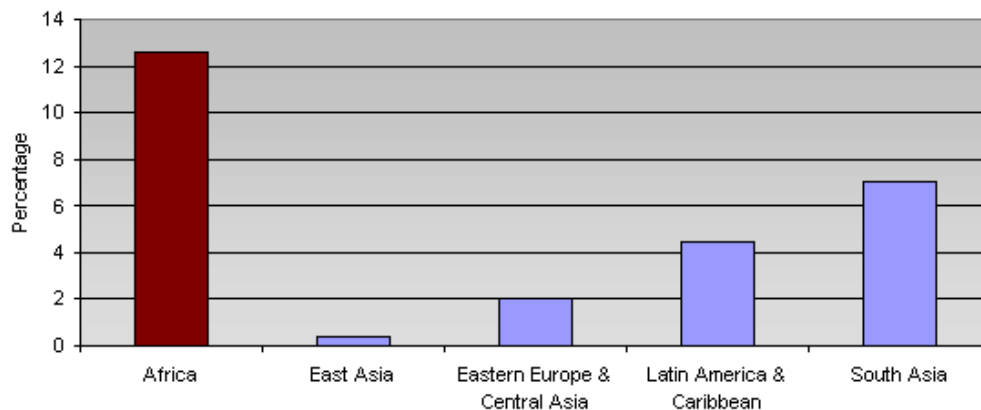
and cheaper forms of energy.⁴ These developments clearly show opportunities for private suppliers, in a sector that is characterized by shortages.

Figure 1: Electricity Balance in Africa; million kilowatt-hours (-deficit; + surplus)



Source: AfDB Statistics

Figure 2: Working hours lost due to power outages, 2009



Source: AICD, 2009

“Between 1990 and 1999 Africa’s private investments in roads was only USD1.4 billion, these investments increased by more than USD 21 billion between 2000 and 2005.”

Transport Infrastructure – Roads – SSA’s total road network is only 204 km per 1,000 km² of land area, of which only about 25% is paved, compared to the world average of 944 km per 1000 km² of land area. This translates into 3.6 km of road per 1,000 persons for the region, relative to a world average of about 7 km per 1000 persons. Behind these numbers however lie huge intra-African disparities (regional and trans-African links are missing, see Annex 1a), with the availability of rural roads ranging

from 0.5 km per thousand of persons in Malawi to 35.5 km in Namibia. Having realized the inadequacy of public funds in developing road infrastructure Africa is moving quickly into toll roads. While Africa was a late starter, it has increased private sector participation in roads. Between 1990 and 1999 Africa’s private investments in roads was only USD1.4 billion, these investments increased by more than USD 21 billion between 2000 and 2005.¹ The USD 385 million Lekki-Epe toll road in Lagos is a recent example.

“The challenge with regards to transport infrastructure is not only limited to the physical deficit but also lack of linkages between roads and rail lines, and poor connectivity to ports.”

“Rail networks are the least developed in Africa, with very little additions to the systems developed in the colonial period. The 1067km long Tazara rail line developed in the 1970s is a notable exception.”

Such investments are expected to be even bigger in the near future, given the existing gaps in major road links. For example, the Maghreb Highway in North Africa is expected to cost USD 11.5 billion over a ten-year period to 2018.

Rail – Rail networks are the least developed in Africa, with very little additions to the systems developed in the colonial period. The 1067km long Tazara rail line developed in the 1970s is a notable exception. Since the 1990s, the lengths of rails have remained unchanged in many countries. In 2007, Africa has 69 000 km of which 55 000 km is operational, most of it in Southern and Northern Africa. Thirteen SSA countries have no operational rail networks, while spatial density of operational rail ranges from 1 to 6. The network density for most African countries range from 30 to 50 per million people with a few countries (Gabon, Botswana and South Africa) having network densities of more than 400. These network densities are very low compared to Europe’s range of 200 to 1000. It is also notable that African exports are largely bulky primary commodities that can be moved more efficiently and at lower costs through rail than road transport. Rail development therefore holds some opportunities for investors. Investments in associated activities like locomotive building, logistics, and communications also exist.

Ports – Whereas Africa operates 64 ports, huge problems remain with respect to capacity and performance of existing facilities as well as handling costs. Over-the-quay container-handling performance is below 20 moves/hour, compared to 25–30 in modern terminals around the world. In addition, handling costs average 50% more than in other parts of the world. With about half of the coastal countries operating port facilities introducing sectoral legislation and regulatory reforms, new investment opportunities will come onboard. Currently, private investments in ports are low yet there is a great need for transshipment facilities. Four regional hubs exist and these include Durban in Southern Africa, Mombasa and Dar-es-Salaam in East Africa, with Djibouti also emerging as a new hub. In West Africa, Abidjan used to play this role but has since lost it to Spain’s Malaga due to civil war.

The challenge with regards to transport infrastructure is not only limited to the physical deficit but also lack of linkages between roads and rail lines, and poor connectivity to ports. This has resulted in Africa being the world’s worst rated region in the Logistics Performance Index (LPI) in 2009, even though the picture varies considerably across countries. As Africa looks at scaling infrastructure investments in the transport sector, the trade impact of such investments will spur growth and development.

Table 1: ITU ICT Development Index (IDI): 2008 top five per region

Europe	IDI rank	Arab States	IDI rank	CIS	IDI rank	Africa	IDI rank
Sweden	1	UAE	29	Russia	48	Seychelles	66
Luxembourg	2	Bahrain	33	Belarus	55	Mauritius	72
Denmark	4	Qatar	45	Ukraine	58	South Africa	92
Netherlands	5	Saudi Arabia	52	Kazakhstan	69	Cape Verde	102
Iceland	6	Kuwait	65	Moldova	73	Botswana	109

Source: ITU, 2009

“Only 65% of Africans have access to clean water compared to 87% for East Asia and Pacific, and 91% for Latin America and the Caribbean.”

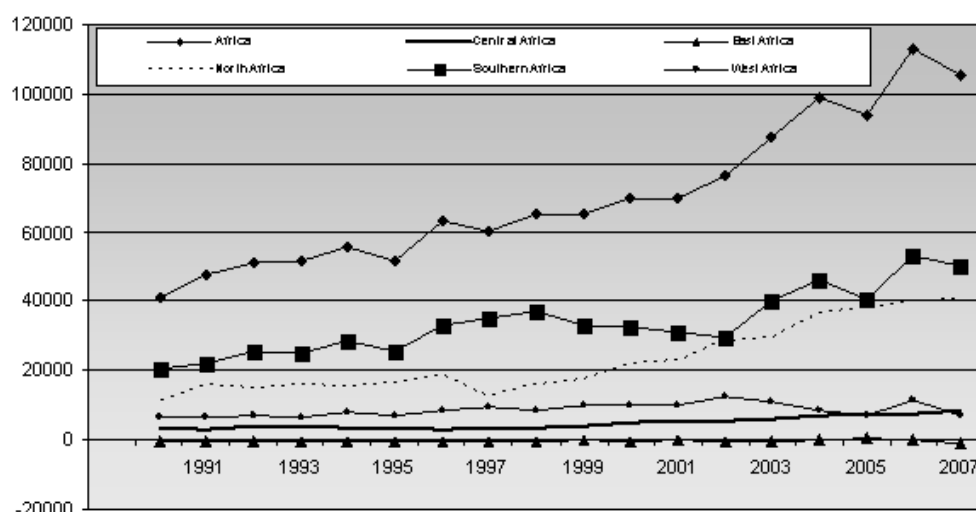
This in turn will have spillover effects in all other sectors that open further opportunities for private sector investments. Within the transport sub-sector, investors have great opportunities in developing systems that improve intermodal efficiency.

Water and Sanitation – Only 65% of Africans have access to clean water compared to 87% for East Asia and Pacific, and 91% for Latin America and the Caribbean. Significant progress has been made in this respect, with five countries (Burkina Faso, Ghana, Malawi, Namibia and South Africa) having met the MDG target as of 2006 and another 12 on course to meet the target by 2015.

However, D.R. Congo and Nigeria are far from meeting the MDG target for clean water.

ICT – Access to fixed-line telephones is below 3% in SSA, compared to 19% in Latin America and the Caribbean, and 16% in the Middle East and North Africa. Mobile phone access in Africa (40%) is better than South Asia (33%) but trails East Asia and the Pacific (53%) and Latin America and the Caribbean (80%).

Figure 3: Regional Internet Users per 1000 Persons



Source: AfDB Statistics and ITU Online data

A similar situation holds for internet usage at the continental level, though North Africa is way ahead of all other African sub-regions (Figure 3). However, the ICT sector has seen increased investments in recent years, estimated at about USD 21 billion in two years from 2007. Expectations are that ICT investments could top USD 70 billion by 2012.¹ The International Telecommunications Union (ITU) also notes that 45 countries have implemented appropriate regulatory frameworks that are supportive of private investment.

Despite some notable achievements in recent years, Africa's level of

infrastructure development is still lower than other low-income regions (Figure 4). In particular, the energy sub-sector has the largest comparative deficit while total road density and access to clean water compare relatively well, though still lagging. For ICT, even the top five African countries are only ranked 66th to 109th on a global scale (Table 1). Sectoral regulatory reforms, however, have opened opportunities for private sector investors as well as the donor community; as such reforms have improved the business environment and enhanced efficiency in implementing and managing infrastructure investments.

“Sectoral regulatory reforms, however, have opened opportunities for private sector investors as well as the donor community; as such reforms have improved the business environment...”

“In spite of the higher total road density on the continent however, most of them are in a poor state and remain unusable.”

“Rural-urban migration, which accounts for about half of the urbanization rate, has take place in spite of capacity constraints for local urban authorities to investment in infrastructure.”

2.2 International Infrastructure Comparison Based on Income Levels

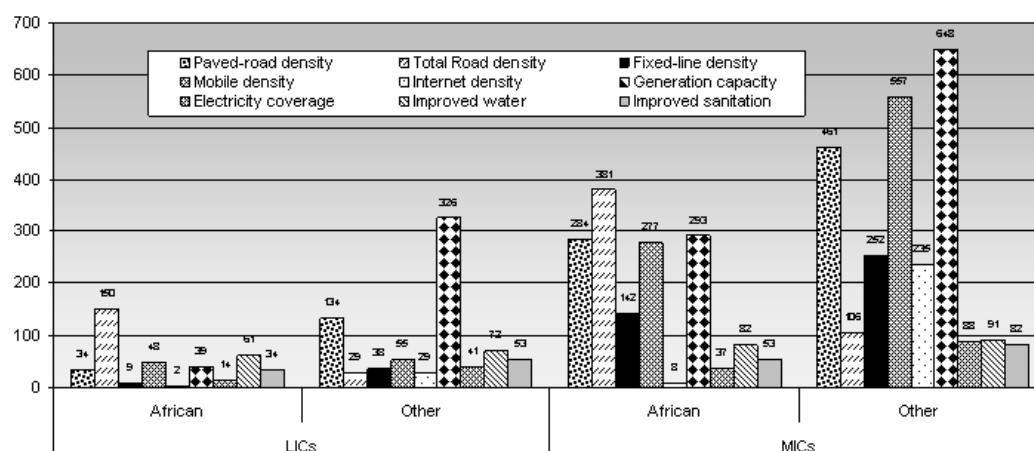
A comparison with other developing countries on the basis of income levels reveals a more severe picture of Africa’s infrastructure deficit (Figure 3). Except for the higher road density in Africa, all other infrastructure indicators show the continent lagging. In spite of the higher total road density on the continent however, most of them are in a poor state and remain unusable. Africa’s position compared to other regions is only encouraging in the supply of clean water and sanitation facilities.

Africa’s infrastructure deficit is more acute among its low-incomes countries (LICs) compared to middle-income ones (MICs). In this context, African LICs are for example 4 times worse off compared to LICs from elsewhere in terms of paved-road density, while African MICs are less than twice as worse-off relative to their peers in other regions.

For power generation, the figures are no better, with African LICs being 8 times worse-off (39 MW per million people compared to 326 MW) and MICs 3 times worse-off compared to their counterparts elsewhere. For internet access, the situation is the reverse, with African MICs almost 30 times worse-off compared to their peers elsewhere and LICs only 14 times. Overall disparities in infrastructure development are more pronounced for paved roads, fixed telephones, and internet access and power generation.

While the huge initial capital outlays requirements go along a way in explaining these differences in infrastructure services, this is compounded by the extent of regulatory constraints in some of the countries, all of which impact on the level of risk faced by investors. Yet we acknowledge the significant changes that are taking place across Africa, including in LICs and Post-conflict countries. For example, Rwanda was ranked as the best reformer in the 2010 Doing Business report.

Figure 4: International Comparisons of Infrastructure Supply Conditions



Source: Based on AICD (2009) data

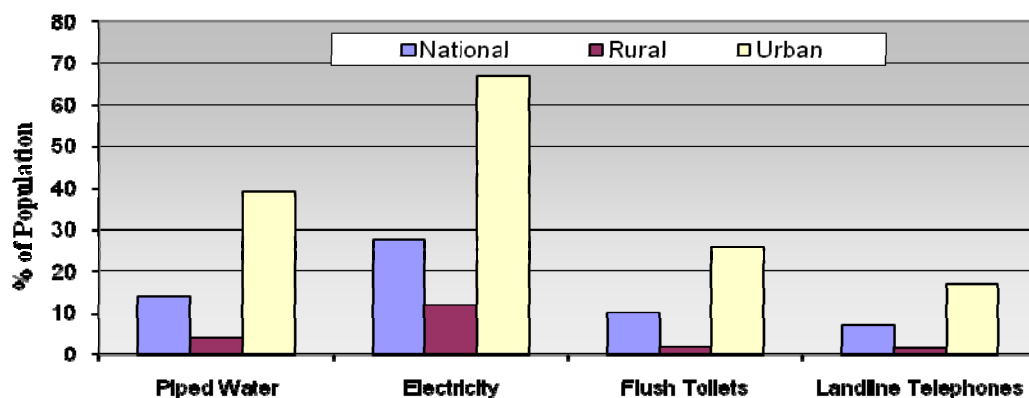
2.3 Rural-urban Divide

There is a wide rural-urban divide in infrastructure supply which is partly explained by rapid urbanization (about 4%) that Africa has been experiencing in recent years (Figure 5).

Rural-urban migration, which accounts for about half of the urbanization rate, has take place in spite of capacity constraints for local urban authorities to investment in infrastructure.

“With about 65% of Africa’s population living in rural areas, governments will need to invest more in rural infrastructure to ensure shared growth.”

Figure 5: International Infrastructure Rural-urban Divide⁷



With about 65% of Africa’s population living in rural areas, governments will need to invest more in rural infrastructure to ensure shared growth. This is because private sector investments will be extremely limited due to commercial viability problems especially in sparsely populated areas. Again, African cities are ranked at the bottom of developing cities worldwide with regards to urban infrastructure.⁸ Intra-African differences are also large, with Dakar having more than 1,500 meters of paved road per thousand inhabitants, which is about four times higher than the next best case (Lagos). At the other extreme, Kinshasa has just 63 meters of paved road per thousand inhabitants, barely half that of the next worst city (Dar-Es-Salaam).

The quality and access to basic services in urban areas are both poor. Yet urban centers present the greatest opportunity for infrastructure development due to the high population densities. The UN-Habitat recommends that building standards in urban areas would need to be reviewed to take into account income differentials if affordable housing is to be provided by the private sector. In this context, urban development by-laws are being revamped in concert with regulatory reforms at the national levels. This will allow greater private sector investments in the housing and the commercial property sector, including the associated social infrastructure and conservation of the environment.

Improvements in the urban environment would positively impact investment flows and the potential for cities to generate the necessary economic dynamism that supports growth.

3. Africa’s Infrastructure Financing Requirements

Infrastructure financing requirements in Africa’s MICs are estimated at about 10% of GDP per year until 2020.⁹ While in absolute terms LICs will require a less amount than MICs, their investment needs are even higher, at about 15% of GDP per year. This implies overall investments of between USD 93 billion per year over the next decade, depending on the realized level of GDP growth. This estimate is well above that of the United Nations (USD 52 billion) in 2008¹⁰, about 75% of which is to go to MICs. The required investments in infrastructure are therefore about twice the current level that has been realized to date. It is almost certain that it will be impossible to scale up investments from current financing sources alone if the demand is to be met. New sources of financing have to be identified and developed while at the same time making greater efforts to maximize the potential of existing infrastructure financing mechanisms.

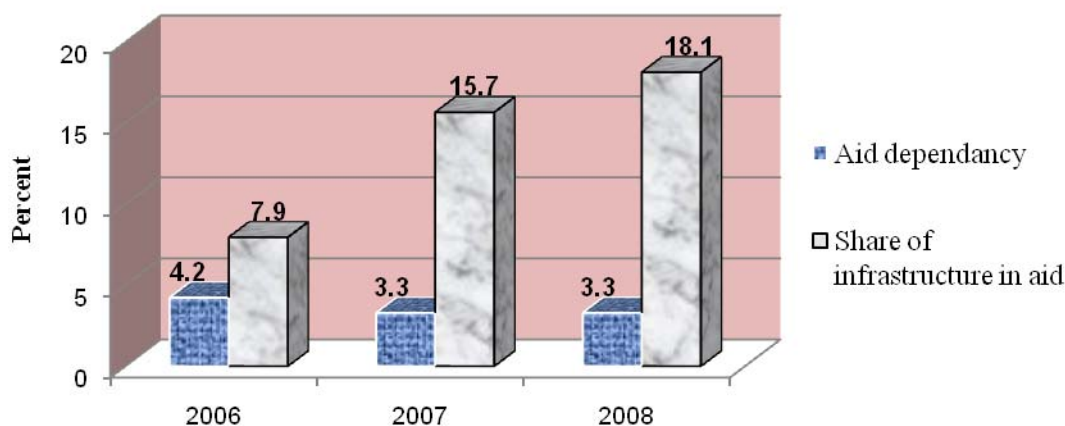
“It is almost certain that it will be impossible to scale up investments from current financing sources alone if the demand is to be met.”

“...private investors and the donor community have increased financing for infrastructure projects in recent years, a trend that continued even through the recent global financial and economic crisis.”

Though daunting, this challenge is not insurmountable. Indeed, private investors and the donor community have increased financing for infrastructure projects in recent years, a trend that continued even through the recent global financial and economic crisis. In this context, infrastructure financing in Africa rose to about USD 42 billion in 2007 from USD 40 billion in 2006. Despite the impact of the global economic downturn, investments by the Infrastructure Consortium for Africa (ICA) members alone went up by 45%, from about USD 14 billion in 2008 to almost USD 20 billion in 2009.¹¹

However, although the share of aid in infrastructure has increased (e.g. from 8% in 2006 to 18% in 2008, see Figure 6) it has been less consistent and unpredictable; yet there is high dependency on aid in some countries (Annex 2). It is also noteworthy that Africa currently meets about two thirds of its infrastructure spending from domestic sources. In addition, the improved policy and business environment is attracting increasing levels of private sector participation through public-private partnerships (PPPs).

Figure 6: Aid Dependency and Aid Allocations to Infrastructure



4. Mobilizing Financing for Infrastructure in Africa

Public infrastructure financing across Africa falls far short of its infrastructure needs and aid alone cannot close this gap. In fact, in several African LICs, official aid is not projected to increase in line with public investment spending.¹² Therefore financing options for closing Africa's infrastructure gaps should focus on broadening the sources of finance and a better allocation of public resources (both domestic and donor funds). This is particularly important given the capital intensity of infrastructure projects. In Nigeria, for instance, a ball-park estimation of the amount of investment required to expand energy generation capacity from 10 000 MW to 30 000 MW is between USD 25 and USD 30 billion.¹³

MICs have better prospects in securing such amounts of financing compared to LICs due to the latter's low levels of financial market development, capacity constraints and perceptions of high risk that limit private sector participation.¹⁴ However both categories of countries must pay particular attention to the regulatory environment. Africa's infrastructure sector is still dominated by monopolistic incumbents who resist against market reforms. While progress has been made in this regard, more still has to be done. For instance, in South Africa entry is still regarded as highly restricted in telecommunications, rail freight and electricity sub-sectors compared to OECD countries. Continent-wide 20 out of 26 countries score less than 5 from a possible maximum of 10 on the services market liberalization index.¹⁵

“...in several African LICs, official aid is not projected to increase in line with public investment spending.”

“South-South FDI investment flows into Africa are estimated at more than USD 60 billion since 2003.”

In this context, greater efforts in identifying alternative and innovative financing mechanisms for infrastructure should be directed towards enhancing private sector participation. Such efforts will have to be complemented with greater efficiency in the allocation of public resources.

a. Mobilizing foreign private capital flows to co-finance infrastructure

South-South partnerships in infrastructure financing are gaining traction, with developing economies’ share in Africa’s annual FDI inflows having increased from around 17.7% in 1999 to around 21% in 2008. South-South FDI investment flows into Africa are estimated at more than USD 60 billion since 2003.¹⁶

For instance, Chinese investments have increased markedly in recent years, rising from only USD 1 billion in 2001 to about USD 7.5 billion in 2006. A total of 35 African countries have particularly benefited, with about 16% of the resources flowing into infrastructure. Average allocations of these flows over the 2001 - 2007 period show that the electricity and transport sub-sectors have benefited most (Figure 7 & 8). It is also noted that the largest recipients of Chinese FDI into infrastructure in Africa are Nigeria, Angola, Sudan and Ethiopia. China has also invested in the transport sub-sector in Nigeria, Gabon and Mauritania.

Figure 7: Chinese Investments by Country, 2001 - 2007

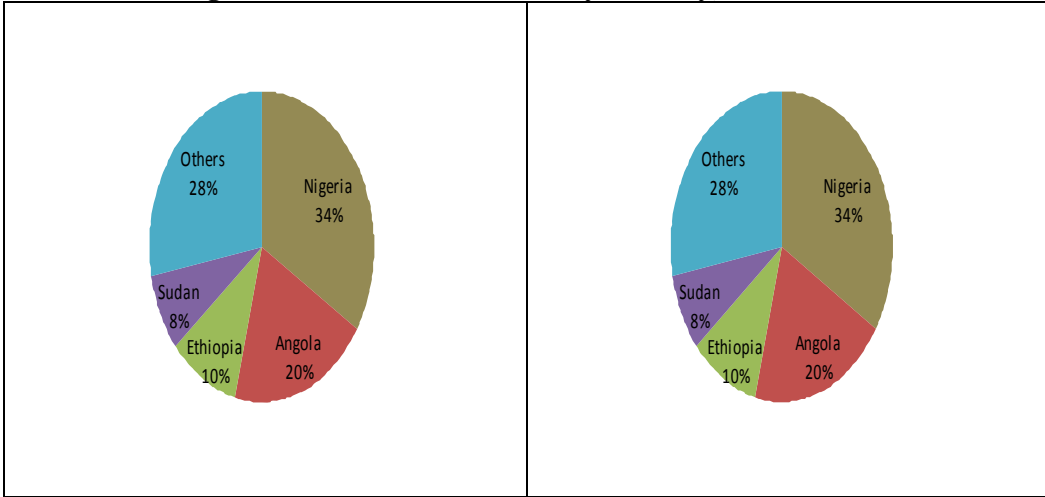
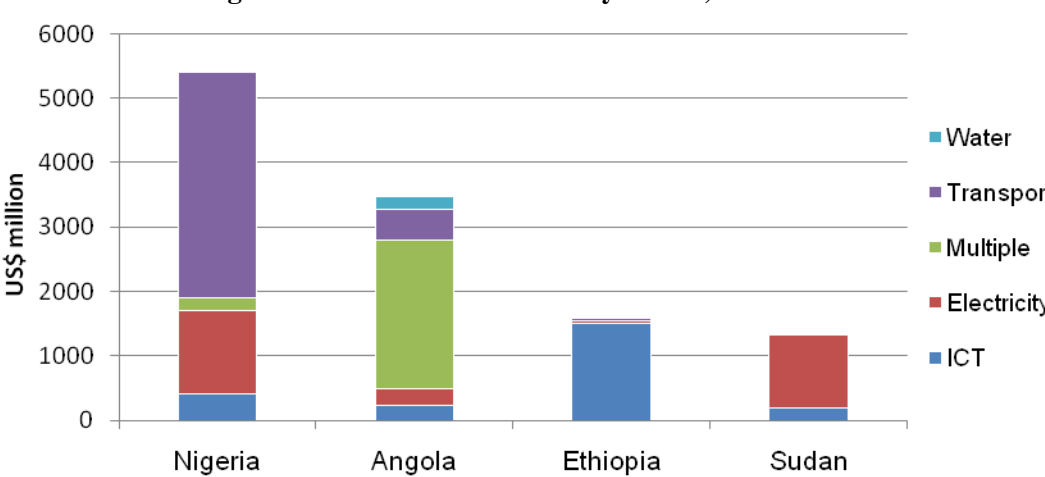


Figure 8: Chinese investments by Sector, 2001 - 2007



Source: World Bank-PPIAF Database, 2009

“Increased focus by the African Development Bank is aimed at catalyzing and leveraging larger resources flows, promotion of regional infrastructure connectivity, narrowing the development gaps among African economies, promoting efficient use of regional infrastructure and reducing the costs to users, and addressing country specific infrastructure capacity constraints.”

b. Alternative domestic and regional private sources of financing infrastructure

- *Infrastructure bonds:* Kenya for example, successfully issued domestic infrastructure bonds, raising almost KSH 30 billion (USD 370 million). However, financial markets are small in some of Africa’s economies such that a regional approach to raising financing through similar instruments would be required.

- *Sovereign Wealth Funds (SWF)* are another important source of investment funds, with the Libyan Arab African Investment Company (for instance) making investments worth USD 800 million in 13 African countries in 2008 alone.¹⁷

c. Commodity-linked bonds

Commodity-linked bonds are yet to be explored in Africa. With some of the continent’s export commodities being traded on the futures market, there are possibilities to issue commodity-linked bonds whose proceeds could be used to boost infrastructure investments. If LDCs had issued debt contracts that were tied to their main export commodities, then their debt burden would decline along with plummeting export prices¹⁸. Such commodity-linked bonds can therefore help hedge against fluctuations in commodity export

earnings and minimize the risk of debt distress when commodity prices fall.

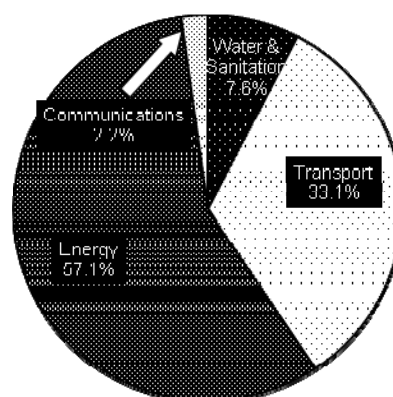
5. The Role of the AfDB in Infrastructure Development

Increased focus by the African Development Bank is aimed at catalyzing and leveraging larger resources flows, promotion of regional infrastructure connectivity, narrowing the development gaps among African economies, promoting efficient use of regional infrastructure and reducing the costs to users, and addressing country specific infrastructure capacity constraints.

5.1 Infrastructure Financing by the Bank

In line with the Bank’s 2008-2012 medium term strategy, infrastructure financing alone accounts for more than half of Bank operations. More than USD6 billion in 2009 out of total operations worth USD12.6 billion was invested in infrastructure of all types presently, accounting for 52% of the Bank’s portfolio. The energy sub-sector received the largest share of 57% (Figure 9). This was mainly in response to power outages and the energy shortage in many countries. The overall approval for infrastructure in 2009 represents an increase of 177.3% compared to 2008¹⁹.

Figure 9: Sectoral Distribution of AfDB Approvals for Infrastructure, 2009



Source: World Bank-PPIAF Database, 2009

“African leaders’ aspirations, as expressed in the creation of the New Economic Partnership for Africa’s Development (NEPAD) in 2001, are supportive of strong partnerships with global and regional institutions.”

African leaders’ aspirations, as expressed in the creation of the New Economic Partnership for Africa’s Development (NEPAD) in 2001, are supportive of strong partnerships with global and regional institutions. In this context, the Bank has been involved in the NEPAD Short-Term Action Plan (STAP), the NEPAD Medium-to-Long-Term Strategic Framework (MLTSF), the African Union Infrastructure Master Plan Initiative, and the Program for Infrastructure Development in Africa (PIDA) that was launched in July 2010.

Other initiatives targeting the infrastructure sector include the NEPAD Infrastructure Project Preparation Fund (IPPF)²⁰, Infrastructure Consortium for Africa (ICA) and the EU-Africa Partnership on Infrastructure. At the end of May 2010 IPPF had an active portfolio of 41 projects (53 in the pipeline until 2015) and has initiated regional infrastructure projects worth around USD 4.7 billion, representing a huge leveraging potential.²¹

An Africa Action Plan priority projects list, worth about USD 32 billion, has also been drawn (Figure 9). Main target projects on this list reflect the magnitude of infrastructure gaps as discussed earlier, with energy being the dominant sub-sector. The major projects include the USD 20 billion Nigeria-Algeria gas connection project, and the Sambangalou Kaleta Hydropower and Kenya-Ethiopia Interconnection, both of which are worth more than USD 1 billion.

The Bank also committed more than USD 4 billion to ICA in two years (2007 – 08), representing about 24% of total contributions to the initiative. The EU-Africa Partnership on Infrastructure’s strategy aims at enhancing good governance, peace and security, economic growth, trade, regional integration and interconnectivity, health, education, and a safe environment.

With this focus, this partnership seeks to reduce wastage through improved efficiency and environment friendly development.

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Improvements in physical infrastructure have been complemented with “soft” infrastructure development, through capacity building and partnerships; harmonization of legislation, regulations, and technical standards; as well as trade facilitation activities in collaboration with national and regional agencies to drive regional integration on the continent.

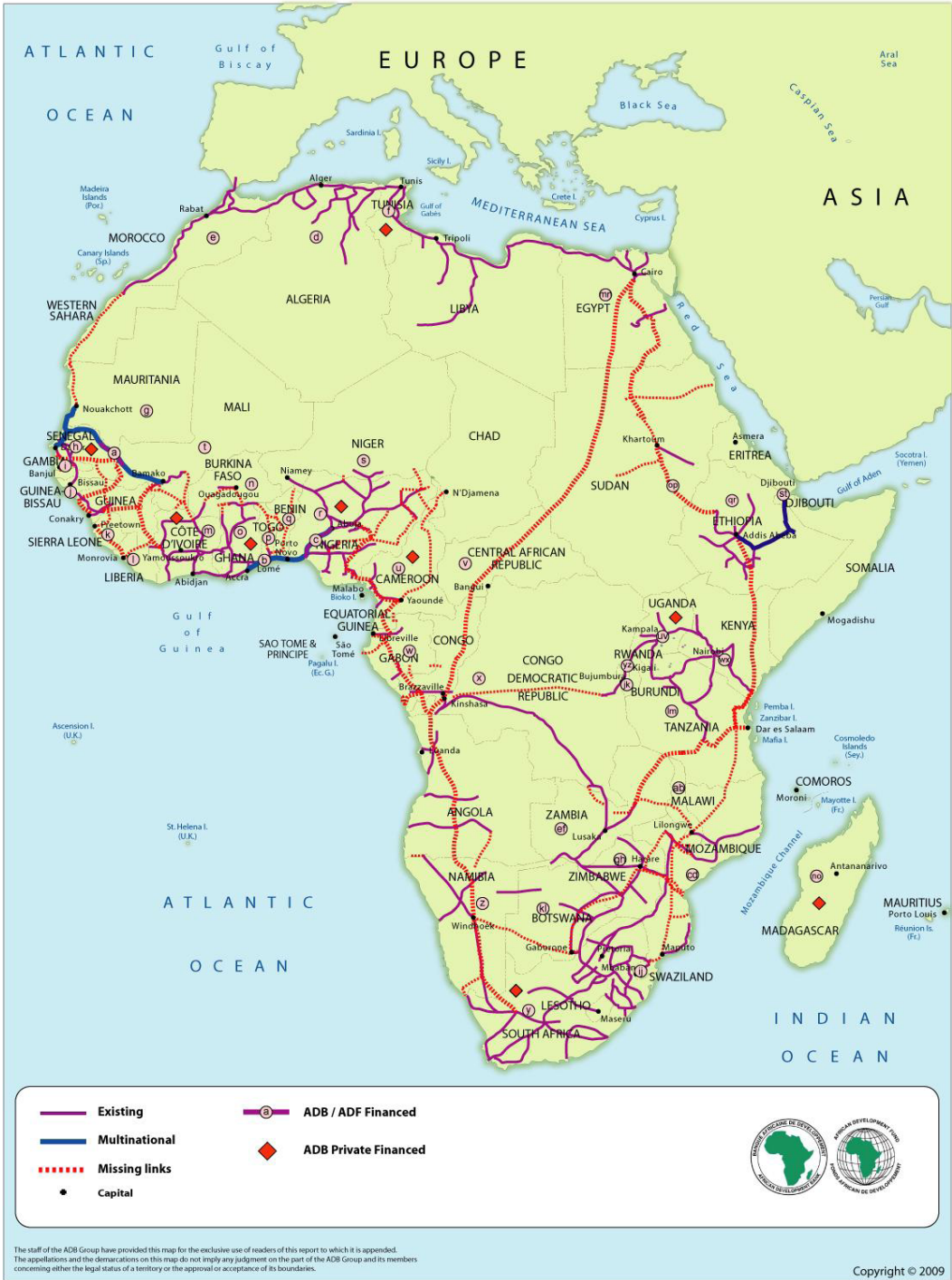
6. Conclusions

Private sector investment opportunities in Africa’s infrastructure are huge and work to identify the projects is underway. Regulatory reforms in both LICs and MICs have also been identified as critical to the realization of the expected investment flows.

It has been clearly noted there are infrastructure deficiencies in all sub-sectors, with LICs facing the greatest challenge. Inefficiencies in implementing infrastructure projects account for USD 17 billion annually and improving the capacity of African countries will help minimize these costs. In this regard, the donor community should play a greater role in African LICs while innovative financing mechanisms must be the focus in MICs. Notably, traditional sources of financing infrastructure development remain important but private investment is critical in closing the current gaps and meeting future infrastructure demand in Africa.

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Annex 1a:
AFRICA'S POWER NETWORKS
MISSING LINKS AND ADB GROUP FINANCED PROJECTS



The staff of the ADB Group have provided this map for the exclusive use of readers of this report to which it is appended. The appellations and the demarcations on this map do not imply any judgment on the part of the ADB Group and its members concerning either the legal status of a territory or the approval or acceptance of its boundaries.

Annex 1b:



Annex 2: Aid, Aid Allocations to Infrastructure and Aid Dependency in African Countries, 2008

Country name	Total Aid (USD mn)	Infrastructure Aid (USD mn)	Aid Dependency (%)	Share of infrastructure in Aid (%)
Algeria	250.7	28.3	0.1	11.3
Angola	674.4	42.4	0.8	6.3
Benin	606.3	137.2	9.1	22.6
Botswana	670.2	1.8	5.0	0.3
Burkina Faso	1284.1	119.5	15.7	9.3
Burundi	647.6	54.4	58.4	8.4
Cameroon	1185.0	239.4	5.0	20.2
Cape Verde	315.3	161.7	18.2	51.3
Central African Rep.	242.1	1.1	12.2	0.5
Chad	484.6	3.2	5.7	0.7
Comoros	33.2	0.4	6.6	1.3
Congo, Dem. Rep.	2981.8	229.2	25.7	7.7
Congo, Rep.	505.1	0.8	4.8	0.2
Cote d'Ivoire	756.8	182.9	3.2	24.2
Djibouti	119.0	10.9	12.1	9.2
Egypt	1696.0	930.4	1.0	54.9
Equatorial Guinea	18.1	0.0	0.1	0.2
Eritrea	98.2	19.0	6.6	19.4
Ethiopia	3374.7	348.8	12.9	10.3
Gabon	118.4	63.5	0.8	53.6
Gambia	48.4	0.1	6.5	0.2
Ghana	2429.0	303.7	15.1	12.5
Guinea	349.4	4.0	7.7	1.1
Guinea-Bissau	124.9	0.2	27.3	0.2
Kenya	1432.5	17.6	4.7	1.2
Lesotho	443.3	1.3	27.8	0.3
Liberia	1101.4	40.0	180.4	3.6
Libya	75.1	5.0	0.1	6.6
Madagascar	1173.4	357.6	12.4	30.5
Malawi	786.9	10.7	18.4	1.4
Mali	1266.1	431.0	14.5	34.0
Mauritania	187.7	8.1	5.3	4.3
Mauritius	167.8	21.7	1.8	12.9
Morocco	2783.1	1352.4	3.1	48.6
Mozambique	2851.3	387.1	28.6	13.6
Namibia	293.0	88.4	3.3	30.2
Niger	835.8	170.8	15.6	20.4
Nigeria	2221.8	489.1	1.1	22.0
Rwanda	1011.4	76.6	22.7	7.6
Sao Tome and Principe	53.4	1.8	30.5	3.3
Senegal	1234.9	241.6	9.3	19.6
Seychelles	15.3	0.0	1.7	0.0
Sierra Leone	426.9	112.0	21.8	26.2
South Africa	1315.7	201.0	0.5	15.3
Sudan	2332.6	94.4	4.0	4.0
Swaziland	126.9	2.5	4.3	1.9
Tanzania	3265.7	1233.3	15.8	37.8
Togo	422.5	73.2	13.3	17.3
Tunisia	1143.3	464.4	2.8	40.6
Uganda	2050.0	188.1	12.4	9.2
Zambia	1730.7	178.3	11.8	10.3
Zimbabwe	594.1	0.9	18.9	0.1
Total Africa	50355.8	9131.6	3.3	18.1

Source: AfDB Statistics and OECD Online Database

Endnotes

- ¹ Africa Infrastructure Diagnostic (AICD) (2009).
- ² The link between infrastructure and growth in African countries (South Africa, Nigeria, Uganda and others) has been shown to be positive (AICD, 2009).
- ³ <http://www.un.org/ecosocdev/geninfo/afrec/subjindx/132inves.htm>
- ⁴ <http://www.informaworld.com/smpp/content~db=all~content=a789690695>
- ⁵ <http://www.emergingafricafund.com/Files/MediaFiles/G8%20Africa%20Infrastructure%20Conf%20June%2009.ppt>.
- ⁶ ITU, 2010.
- ⁷ Banerjee, S., Wodon, Q., Diallo, A., Pushak, T., Uddin, H., Tsimpo, C. and Foster, V. (2008) *Access, Affordability, and Alternatives: Modern Infrastructure Services in Africa*, Africa Infrastructure Country Diagnostic.
- ⁸ Mercer 2010 Quality of Living Survey <http://www.mercer.com/qualityoflivingpr>
Most of the region's cities rank below 100 in the eco-index. The highest-ranking cities are Cape Town (30), Victoria (38) and Johannesburg (54). Antananarivo in Madagascar (217) is at the bottom of the list.
- ⁹ Africa Infrastructure Country Diagnostic 2009, World Bank, African Development Bank, African Union, Agence Française de Développement, European Union, New Economic Partnership for Africa's Development, Public-Private Infrastructure Advisory Facility, and U.K. Department for International Development.
- ¹⁰ Africa Infrastructure Diagnostic (AICD) (2009).
- ¹¹ <http://www.afdb.org/en/news-events/article/6th-infrastructure-consortium-for-africa-ica-annual-meeting-agreement-for-closer-collaboration-on-regional-projects-among-stakeholders-6689/>
- ¹² Redifer, L. (2010), 'New Financing Sources for Africa's Infrastructure Deficit', *IMF Survey*, (July 21).
- ¹³ Anyanwu, J. C. (2009) 'Public-private Partnerships in the Nigerian Energy Sector: Banks Roles and Lessons of Experience,' in Tobin, J. B. and Parker, L. R. (eds) *Joint Ventures, Mergers and Acquisitions, and Capital Flow* Nova Science Publishers, New York.
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- ¹⁵ OECD (2010) 'Going for growth in Brazil, China, India, Indonesia and South Africa,' in *Economic Policy Reforms: Going for Growth*, May 2010.
- ¹⁶ Stevens and Freemantle (2010) 'BRIC and Africa: New sources of foreign capital mobilizing for Africa complementing and competing with traditional investors,' Standard Bank.
- ¹⁷ <http://www.oecd.org/dataoecd/31/36/41865534.pdf>
- ¹⁸ Atta-Mensah (2004) 'Commodity-Linked Bonds: A Potential Means for Less-Developed Countries to Raise Foreign Capital' Bank of Canada Working Paper 2004-20.
- ¹⁹ The key infrastructure projects approved by the Bank in 2009 included airport projects in Morocco and Tunisia, national road projects in Burkina Faso, Cameroon, Chad, Ghana, Guinea, Mali, Sierra Leone, Malawi, Rwanda, Senegal and Uganda. The others are multinational road projects connecting Cameroon-Nigeria, Cameroon-Gabon, Kenya-Ethiopia and Mozambique-Malawi-Zambia. The Bank Group (African Development Fund and the African Development Bank) also approved power projects in Botswana, Kenya, Lesotho, Nigeria, South Africa and Tunisia.
- ²⁰ The Bank's commitment to this Fund at the end of 2007/08 was USD18 million, with USD22.5 million committed by UK's DFID, Germany and Norway. Other countries have shown interest to contribute to the Fund.
- ²¹ The World Bank's Multilateral Investment Guarantee Agency (MIGA) is also providing information on infrastructure investment opportunities in Africa where it has identified 162 projects in all sub-sectors.

